

ABSTRACT

Key to the present invention is the subsequent use of two layers of different positive photoresists, possessing different exposure wavelength sensitivities. It is a general object of the present invention to provide a new and improved method of forming semiconductor integrated circuit devices, and more specifically, in the formation of self-aligned dual damascene interconnects and vias, which incorporates two positive photoresist systems, which have different wavelength sensitivities, to form trench/via openings with only a two-step etching process. In addition, the two layers of photoresist exhibit different etch resistant properties, for subsequent selective reactive ion etching steps. The use of a "high contrast" positive photoresist system has been developed wherein the resist system exposure sensitivity is optimized for wavelengths, deep-UV (248nm) for the top layer of resist, the trench pattern, and I-line (365nm) for the bottom layer of resist, the via pattern. The resist system provides a process in dual damascene for trench/via formation and has the following properties: selective etch resistance, thermal stability during processing, ease of processing and developing, and good adhesion properties.

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